


UNITED STATES DISTRICT COURT  
FOR THE SOUTHERN DISTRICT OF INDIANA  
INDIANAPOLIS DIVISION

UNITED STATES OF AMERICA,	)	
	)	
Plaintiff,	)	
	)	
INDIANA DEPARTMENT OF	)	
ENVIRONMENTAL MANAGEMENT,	)	
	)	
Intervening Plaintiff,	)	
	)	CIVIL ACTION NO. IP902077C
v.	)	
	)	HONORABLE JUDGE SARAH E. BARKER
	)	
REFINED METALS CORPORATION,	)	
	)	
Defendant.	)	

CONSENT DECREE

EXHIBIT A: Facility Map Identifying Waste Piles

KEY:  
 = area of waste piles / surface impoundment

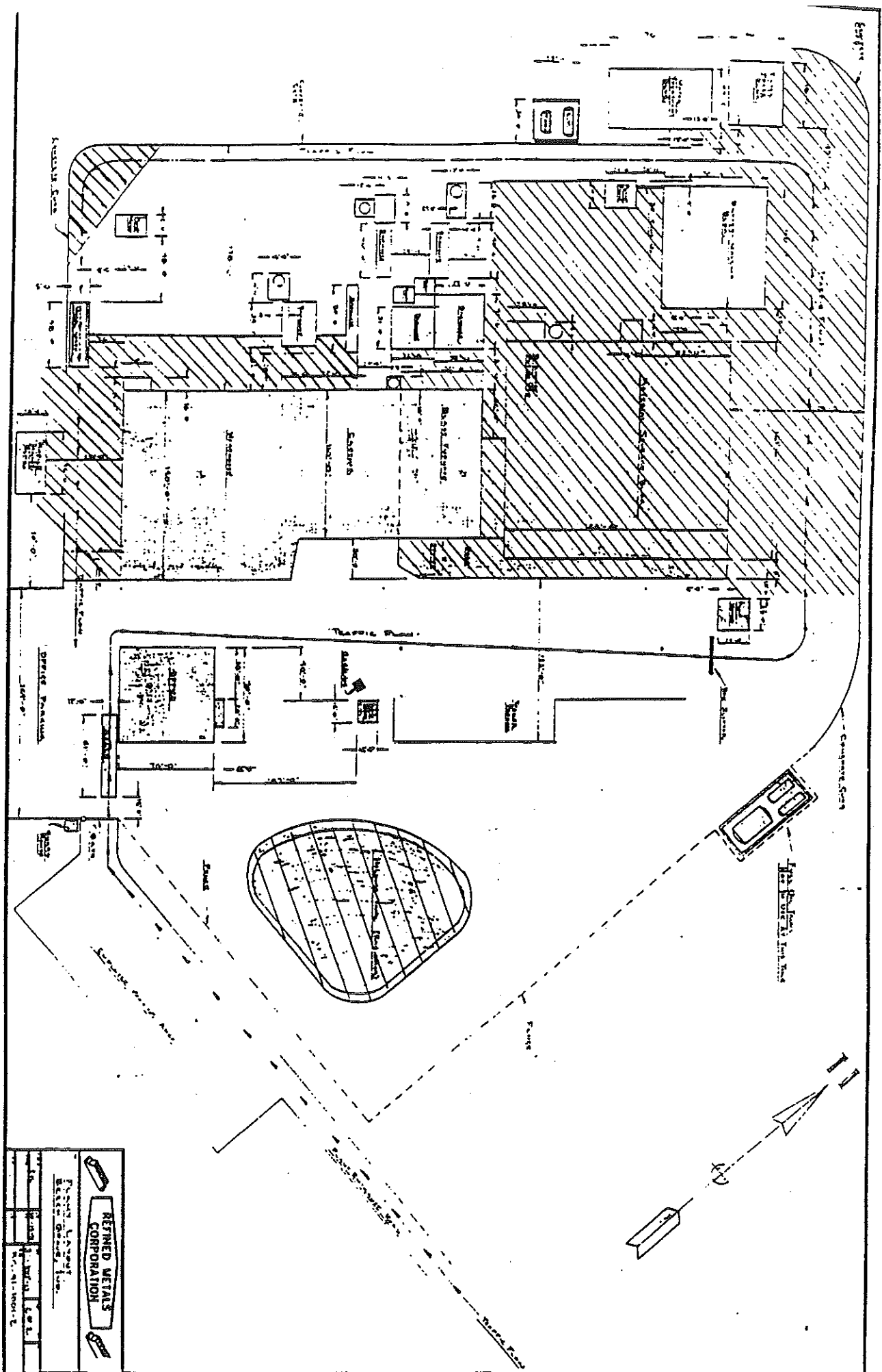


EXHIBIT A



UNITED STATES OF AMERICA,  
Plaintiff,  
INDIANA DEPARTMENT OF  
ENVIRONMENTAL MANAGEMENT,  
Intervening Plaintiff,  
v.  
REFINED METALS CORPORATION,  
Defendant.

CIVIL ACTION NO. IP902077C  
HONORABLE JUDGE SARAH E. BARKER

## EXHIBIT B: Scope of Work for a RCRA Facility Investigation

**EXHIBIT B**  
**SCOPE OF WORK FOR A RCRA FACILITY INVESTIGATION**  
**AT REFINED METALS CORPORATION, INDIANAPOLIS, INDIANA**

**PURPOSE**

The purpose of this RCRA Facility Investigation (RFI) is to determine the nature and extent of the release of hazardous waste or hazardous constituents from regulated units, solid waste management units, and other source areas at the Facility, and to gather necessary data to support the Corrective Measures Study. Defendant shall furnish all personnel, materials, and services necessary for, or incidental to, performing the RCRA Facility Investigation at Refined Metals Corporation, 3700 South Arlington Avenue, Indianapolis, Indiana.

**SCOPE**

The RCRA Facility Investigation consists of six tasks:

Task I: Description of Current Conditions

- A. Facility Background
- B. Nature and Extent of Contamination
- C. Implementation of Interim Measures (optional)

Task II: Pre-Investigation Evaluation of Corrective Measure Technologies

Task III: RFI Workplan Requirements

- A. Project Management Plan
- B. Quality Assurance Project Plan (QAPjP)
- C. Data Management Plan
- D. Health and Safety Plan
- E. Community Relations Plan

Task IV: Facility Investigation

- A. Environmental Setting
- B. Source Characterization
- C. Contamination Characterization
- D. Potential Receptors

Task V: Investigation Analysis

- A. Data Analysis
- B. Protection Standards

Task VI: Reports

- A. Preliminary and Workplan
- B. Progress
- C. Draft and Final

TASK I: DESCRIPTION OF CURRENT CONDITIONS

Defendant shall submit for U.S. EPA approval, a report providing the background information pertinent to the facility and contamination as set forth below. The data gathered during any previous investigations, and other relevant data shall be included.

A. Facility Background

Defendant's report shall summarize the regional location, pertinent boundary features, general facility physiography, hydrogeology, and historical use of the facility for the treatment, storage, or disposal of solid and hazardous waste. Defendant's report shall include:

1. Maps depicting the following:
  - a. General geographic location;
  - b. Property lines with owners of all adjacent property clearly indicated;
  - c. Topography and surface drainage depicting all waterways, wetlands, floodplains, water features, drainage patterns, and surfacewater containment areas;
  - d. All tanks, buildings, utilities, paved areas, easements, rights-of-way, and other features;
  - e. All solid or hazardous waste treatment, storage, or disposal areas active after November 19, 1980;
  - f. All known past solid or hazardous waste treatment, storage or disposal areas regardless of whether they were active on November 19, 1980;
  - g. All known past and present product and waste underground tanks or piping;
  - h. Surrounding land uses (residential, commercial, agricultural, recreational);
  - i. The location of all past and present production, recovery and groundwater monitoring wells. These wells shall be clearly labeled, and ground and top of casing elevations and construction details included. These elevations and details may be included as an attachment which outlines well depth, aquifer(s) screened, screen length, screen interval (AMSL), well diameter, well material and openhole or sand/gravel pack interval (AMSL); and
  - j. Terrestrial Habitat Cover - Types (i.e. vegetation communities).

All maps shall be consistent with the requirements set forth in 40 CFR 270.14 and be of sufficient detail and accuracy to locate and report all current and future work performed at the site.

2. A history and description of the ownership and operation, solid and hazardous waste generation, treatment, storage, and disposal activities at the facility.
3. Exact dates or approximate periods of past product and waste spills or deposits, identification of the materials spilled, the amount spilled, the amount recovered, the location where spilled, media impacted, and a description of the response actions conducted (local, State, or Federal response units or private parties), including any inspection reports or technical reports generated as a result of the response.
4. A summary of past and present environmental permits requested and/or received, any enforcement actions and their subsequent responses, and a list of documents and studies prepared for the facility.
5. Description of major habitat types (e.g., grasslands, forests, lakes, streams, wetlands) located in, adjacent to, or affected by the facility. In delineating wetlands, the U.S. Fish and Wildlife Service's National Wetland inventory maps should be consulted. In addition, if the facility is located in a state other than Michigan, The U.S. Corps of Engineers should be consulted and wetlands should be delineated using the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (this manual is currently undergoing revision. Until the revision is finalized, the Corps of Engineers should be consulted).
6. Description of plants and animals at and adjacent to the site, should include the following: qualitative observations of resident plants and animals (birds, mammals, fish, stream benthos, etc.); classification of vegetation community types; threatened and endangered species possibly on or near the site should be identified.

B. Nature and Extent of Contamination

Defendant shall prepare and submit for U.S. EPA approval, a preliminary report describing the existing information on the nature and extent of contamination.

1. Defendant's report shall summarize all possible source areas of contamination. This, at a minimum, should include all regulated units, solid waste management units, spillage areas, and other suspected source areas of contamination. For each area, Defendant shall identify the following:

- a. Location of unit/area (which shall be depicted on a facility map;
  - b. Quantities of solid and hazardous wastes present;
  - c. Hazardous waste or constituents, to the extent known; and
  - d. Identification of areas where additional information is necessary.
2. Defendant shall prepare an assessment and description of the existing degree and extent of contamination. This should include:
- a. Available monitoring data and qualitative information on locations and levels of contamination at the facility;
  - b. All potential migration pathways including information on geology, pedology, physiography, hydrogeology, hydrology, water quality, meteorology, air quality, and migration through food chains; and
  - c. The potential impacts on human health and the environment, including demography, groundwater and surface water use, land use, and potential ecological receptors, including any threatened or endangered species. (Threatened or endangered species possibly on or near the site should be identified as early as possible.) This assessment should be based on existing site information, literature-based information on contaminant fate and toxicity, and available criteria and standards (e.g., Ambient Water Quality Criteria).
  - d. Any known or observed effects of site contaminants to biota, such as fish kills, stressed vegetation, or other obvious impacts.

C. Implementation of Interim Measures

If an interim measure is determined to be necessary, Defendant shall prepare and submit for approval, an Interim Measures Workplan in accordance with Appendix A to this Scope of Work.

TASK II: PRE-INVESTIGATION EVALUATION OF CORRECTIVE MEASURE TECHNOLOGIES

Prior to starting the facility investigation, the Defendant shall submit to U.S. EPA a report that identifies the potential corrective measure technologies that may be used on-site or off-site for the containment, treatment, remediation, and/or disposal of contamination from the facility. This report shall also identify any field data that needs to be collected in the facility investigation to facilitate the evaluation and selection of the final corrective measures (e.g., compatibility of waste and construction materials, information to evaluate effectiveness, treatability of wastes, etc.).

TASK III: RFI WORKPLAN REQUIREMENTS

Defendant shall prepare a RCRA Facility Investigation (RFI) Workplan. The RFI Workplan shall include the development of several plans, which shall be prepared concurrently. During the RCRA Facility Investigation, it may be necessary to revise the RFI Workplan to increase or decrease the detail of information collected to accommodate the facility specific situation. The RFI Workplan includes the following:

A. Project Management Plan

Defendant shall prepare a Project Management Plan which will include a discussion of the technical approach, schedules, budget, and personnel. The Project Management Plan also will include a description of the qualifications of personnel performing or directing the RFI, including contractor personnel. This plan shall document the overall management approach to the RCRA Facility Investigation.

B. Quality Assurance Project Plan (QAPjP)

Defendant shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analyses performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented. The QAPjP shall be prepared in accordance with Exhibit F. A pre-QAPjP meeting shall be held prior to preparation of the QAPjP. Participants should include, but are not limited to the Defendant, their QAPjP preparer, laboratory representatives, U.S. EPA Project Coordinator, U.S. EPA Quality Assurance and Laboratory representatives.

(A performance audit will be conducted by U.S. EPA on laboratories selected by Defendant. This audit must be completed and laboratories approved for use on the project prior to the start of field work for the RFI.)

C. Data Management Plan

Defendant shall develop and initiate a Data Management Plan to document and track investigation data and results. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

1. Data Record

The Data record shall include the following:

- a. Unique sample or field measurement code;

- b. Sampling or field measurement location and sample or measurement type;
- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID number;
- e. Property or component measured; and
- f. Result of analysis (e.g., concentration).

## 2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for statistical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

## 3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleth plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Display levels of contamination at each sampling location;
- d. Display geographical extent of contamination;
- e. Display contamination levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport and show potential receptors.

D. Health and Safety Plan

Defendant shall prepare a Health and Safety Plan.

1. The Health and Safety Plan shall:

- a. Provide a facility description, including availability of resources such as roads, water supplies, electricity and telephone service;
- b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;
- c. List key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- d. Delineate work area;
- e. Describe levels of protection to be worn by personnel;
- f. Establish procedures to control site access;
- g. Describe decontamination procedures for personnel and equipment;
- h. Establish site emergency procedures;
- i. Address emergency medical care for injuries and toxicological problems;
- j. Describe requirements for an environmental surveillance program;
- k. Specify any routine and special training required for responders; and
- l. Establish procedures for protecting workers from weather-related problems.

2. The Facility Health and Safety Plan shall be consistent with:

- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);
- b. U.S. EPA Order 1440.1 - Respiratory Protection;
- c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
- d. Facility Contingency Plan;
- e. U.S. EPA Standard Operating Safety Guide (1984);

- f. OSHA regulations, particularly those in 29 CFR 1910 and 1926;
- g. State and local regulations; and
- h. Other U.S. EPA guidance as provided.

E. Community Relations Plan

The Defendant shall prepare a plan, for the dissemination of information to the public regarding investigation activities and results.

TASK IV: FACILITY INVESTIGATION

Defendant shall conduct those investigations necessary to: characterize the facility (Environmental Setting); define the source (Source Characterization); define the degree and extent of contamination (Contamination Characterization); and identify actual or potential receptors (Potential Receptor Identification). The investigations should result in data of adequate technical content to support the development and evaluation of the corrective measure alternatives during the Corrective Measures Study.

The site investigation activities shall follow the plans set forth in Task III. All sampling and analyses shall be conducted in accordance with the Data Collection Quality Assurance Plan. All sampling locations shall be documented in a log and identified on a detailed site map.

A. Environmental Setting

Defendant shall collect information to supplement and verify existing information on the environmental setting at the facility. Defendant shall characterize the following:

1. Hydrogeology

Defendant shall conduct a program to evaluate hydrogeologic conditions at the facility. This program shall provide the following information:

- a. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting groundwater flow beneath the facility, including:
  - i) Regional and facility specific stratigraphy: description of strata including strike and dip; and identification of stratigraphic contacts;
  - ii) Structural geology: description of local and regional structural features (e.g., folding, faulting, tilting, jointing, etc.);
  - iii) Depositional history;
  - iv) Identification and characterization of areas and amounts of recharge and discharge;
  - v) Regional and facility specific groundwater flow patterns; and
  - vi) Seasonal variations in the groundwater flow regime;
- b. An analysis of any topographic features that might influence the groundwater flow system;

- c. Based on field data, tests, and cores, a representative and accurate classification and description of the hydrogeologic units which may be part of the migration pathways at the facility (i.e., the aquifers and any intervening saturated and unsaturated units), including:
  - i) Hydraulic conductivity and porosity (total and effective);
  - ii) Lithology, grain size, sorting;
  - iii) An interpretation of hydraulic interconnections between saturated zones; and
  - iv) The attenuation capacity and mechanisms of the natural earth materials (e.g., ion exchange capacity, organic carbon content, mineral content etc.);
- d. Based on field studies and cores, structural geology and hydrogeological cross-sections showing the extent (depth, thickness, lateral extent) of hydrogeologic units which may be part of the migration pathways, identifying:
  - i) Sand and gravel deposits in unconsolidated deposits;
  - ii) Zones of fracturing or channeling in consolidated or unconsolidated deposits;
  - iii) Zones of high permeability or low permeability that might direct or restrict the flow of contaminants;
  - iv) The uppermost aquifer (geologic formation, group of formations, or part of a formation capable of yielding a significant amount of groundwater to wells or springs); and
  - v) Water-bearing zones above the first confining layer that may serve as a pathway for contaminant migration, including perched zones of saturation;
- e. Based on data obtained from groundwater monitoring wells and piezometers installed upgradient and downgradient of the potential contaminant source, a representative description of water level or fluid pressure monitoring, including:
  - i) Water-level contour and/or potentiometric maps;
  - ii) Hydrogeologic cross-sections showing vertical gradients;
  - iii) The flow system, including the vertical and horizontal components of flow; and

- iv) Any temporal changes in hydraulic gradients, for example due to tidal or seasonal influences; and
- f. A description of man-made influences that may affect the hydrogeology of the site, identifying:
  - i) Active and inactive local water-supply and production wells with an approximate schedule of pumping; and
  - ii) Man-made hydraulic structures (pipelines, French drains, ditches, unlined ponds, septic tanks, NPDES outfalls, retention areas, etc.).

## 2. Soils

Defendant shall conduct a program to characterize the soil and rock units above the water table in the vicinity of the contaminant releases. Such characterization shall include but not be limited to, the following information:

- a. SCS soil classification;
- b. Surface soil distribution;
- c. Soil profile, including ASTM classification of soils;
- d. Transects of soil stratigraphy;
- e. Hydraulic conductivity (saturated and unsaturated);
- f. Relative permeability;
- g. Bulk density;
- h. Porosity;
- i. Soil sorptive capacity;
- j. Cation exchange capacity (CEC);
- k. Soil organic content;
- l. Soil pH;
- m. Particle size distribution;
- n. Depth of water table;
- o. Moisture content;
- p. Effect of stratification on unsaturated flow;
- q. Infiltration;

- r. Evapotranspiration;
- s. Storage capacity;
- t. Vertical flow rate; and
- u. Mineral content.

3. Surface Water and Sediment

Defendant shall conduct a program to characterize the surface water bodies in the vicinity of the facility. Such characterization shall include, but not be limited to, the following activities and information:

- a. Description of the temporal and permanent surface water bodies including:
  - i) For lakes: location, elevation, surface area, inflow, outflow, depth, temperature stratification, volume, and a description of substrate and cover;
  - ii) For impoundments: location, elevation, surface area, depth, volume, freeboard, and purpose of impoundment;
  - iii) For streams, ditches, wetlands, and channels: location, elevation, flow, velocity, depth, width, seasonal fluctuations, and flooding tendencies (i.e., 100 year event), and a description of substrate and surface cover.
  - iv) Drainage patterns; and
  - v) Evapotranspiration;
- b. Description of the chemistry of the natural surface water and sediments. This includes determining the pH, total dissolved solids, total suspended solids, biological oxygen demand, alkalinity, conductivity, dissolved oxygen profiles, nutrients ( $\text{NH}_3$ ,  $\text{NO}_3^-/\text{NO}_2^-$ ,  $\text{PO}_4^{3-}$ ), chemical oxygen demand, total organic carbon, specific contaminant concentrations, etc; and
- c. Description of sediment characteristics including:
  - i) Depositional area;
  - ii) Thickness profile; and
  - iii) Physical and chemical parameters (e.g., grain size, distribution, density, organic carbon content, ion exchange capacity, pH, etc., and other parameters as directed by U.S. EPA.

4. Air

Defendant shall provide information characterizing the climate in the vicinity of the facility. Such information shall include, but not be limited to:

a. A description of the following parameters:

- i) Annual and monthly rainfall averages;
- ii) Monthly temperature averages and extremes;
- iii) Wind speed and direction;
- iv) Relative humidity/dew point;
- v) Atmospheric pressure;
- vi) Evaporation data;
- vii) Development of inversions; and
- viii) Climate extremes that have been known to occur in the vicinity of the facility, including frequency of occurrence; and

b. A description of topographic and man-made features which affect air flow and emission patterns, including:

- i) Ridges or hills or mountain areas;
- ii) Valleys and Canyons;
- iii) Surface water bodies (e.g., rivers, lakes, bays, etc.);
- iv) Wind breaks and forests; and
- v) Buildings.

B. Source Characterization

Defendant shall collect analytical data to completely characterize the wastes and the areas where wastes have been placed, collected, or removed, including: type; quantity; physical form; disposition (containment or nature of deposits); and facility characteristics affecting release (e.g., facility security, and engineered barriers). This shall include quantification of the following specific characteristics, at each source area:

1. Unit/Disposal area characteristics:

- a. Location of unit/disposal area;
- b. Type of unit/disposal area;

- c. Design features;
  - d. Operating practices (past and present);
  - e. Period of operation;
  - f. Age of unit/disposal area;
  - g. General physical conditions; and
  - h. Method used to close the unit/disposal area.
2. Waste characteristics:
- a. Type of wastes placed in each unit, including:
    - i) Hazardous classification (e.g., flammable, reactive corrosive, oxidizing or reducing agent);
    - ii) Quantity;
    - iii) Chemical composition; and
    - iv) Waste form (bulk or containerized);
  - b. Physical and chemical characteristics:
    - i) Physical form (solid, liquid, gas);
    - ii) Physical description (e.g., powder, oily sludge);
    - iii) Temperature;
    - iv) pH;
    - v) General chemical class (e.g., acid, base, solvent);
    - vi) Molecular weight;
    - vii) Density;
    - viii) Boiling point;
    - ix) Viscosity;
    - x) Solubility in water;
    - xi) Cohesiveness of the waste;
    - xii) Vapor pressure; and

xiii) Flash point.

c. Migration and dispersion characteristics:

- i) Sorption;
- ii) Biodegradability, bioconcentration, biotransformation;
- iii) Photodegradation rates;
- iv) Hydrolysis rates; and
- v) Chemical transformation.
- vi) Defendant shall document the procedures used in making the above determinations.

C. Contamination Characterization

Defendant shall collect analytical data on groundwater, soils, surface water, sediment, air, and subsurface gas contamination in the vicinity of the facility. This data shall be sufficient to define the extent, origin, direction, and rate of movement of contaminant plumes. Data shall include time and location of samplings, medias sampled, concentrations of contaminants found, conditions during sampling, and the identity of the individuals performing the sampling and analysis. Defendant shall address the following types of contamination at the facility:

1. Groundwater Contamination

Defendant shall conduct a Groundwater Investigation to characterize any plumes of contamination at the facility. This investigation shall at a minimum provide the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plumes originating from the facility;
- b. The horizontal and vertical directions of contamination movement;
- c. The velocities of contaminant movement;
- d. The horizontal and vertical concentration profiles of Appendix IX constituents in the plumes;
- e. An evaluation of factors influencing the plume movement; and
- f. An extrapolation of future contaminant movement. Defendant shall document the procedures to be used in making the above

determinations (e.g., well design, well construction, geophysics, modeling, etc.).

## 2. Soil Contamination

Defendant shall conduct an investigation to characterize the contamination of the soil and rock units above the water table in the vicinity of the contaminant release. The investigation shall include the following information:

- a. A description of the vertical and horizontal extent of contamination;
- b. A description of contaminant and soil chemical properties within the contaminant source area and plume. This includes contaminant solubility, speciation, adsorption, leachability, exchange capacity, biodegradability, hydrolysis, photolysis, oxidation, and other factors that might affect contaminant migration and transformation;
- c. Specific contaminant concentrations;
- d. The velocity and direction of contaminant movement; and
- e. An extrapolation of future contaminant movement.

Defendant shall document the procedures used in making the above determinations.

## 3. Surface Water and Sediment Contamination

Defendant shall conduct a surface water investigation to characterize contamination in surface water bodies resulting from the contaminant releases at the facility. The investigation shall include, but not be limited to, the following information:

- a. A description of the horizontal and vertical extent of any immiscible or dissolved plume(s) originating from the facility, and the extent of contamination in underlying sediments;
- b. The horizontal and vertical direction of contaminant movement;
- c. The contaminant velocities;
- d. An evaluation of the physical, biological and chemical factors influencing contaminant movement;
- e. An extrapolation of future contaminant movement; and

- f. A description of the chemistry of the contaminated surface waters and sediments. This includes determining the pH, total dissolved solids, and specific contaminant concentrations, etc.

Defendant shall document the procedures used in making the above determinations.

#### 4. Air Contamination

Defendant shall conduct an investigation to characterize the particulate and gaseous contaminants released into the atmosphere. This investigation shall provide the following information:

- a. A description of the horizontal and vertical direction and velocity of contaminant movement;
- b. The rate and amount of releases; and
- c. The chemical and physical composition of the contaminants released, including horizontal and vertical concentration profiles.

Defendant shall document the procedures used in making the above determinations.

#### 5. Subsurface Gas Contamination

Defendant shall conduct an investigation to characterize subsurface gases emitted from buried hazardous waste and hazardous constituents in the groundwater. This investigation shall provide the following information:

- a. A description of the horizontal and vertical extent of subsurface gas migration;
- b. The chemical composition of the gases being emitted;
- c. The rate, amount, and density of the gases being emitted; and
- d. Horizontal and vertical concentration profiles of the subsurface gases emitted.

Defendant shall document the procedures used in making the above determinations.

#### D. Potential Receptors Identification

Defendant shall collect data describing the human populations and environmental systems that are susceptible to contaminant exposure from the facility. Chemical analysis of biological samples may be needed.

Data on observable effects in ecosystems also may be needed. The following characteristics shall be identified:

1. Local uses and possible future uses of groundwater:
  - a. Type of use (e.g., drinking water source, municipal, residential, agricultural, domestic/non-potable, and industrial); and
  - b. Locations of groundwater users, including wells and discharge areas.
2. Local uses and possible future uses of surface water draining from the facility:
  - a. Domestic and municipal (e.g., potable, lawn/gardening watering);
  - b. Recreational (e.g., swimming, fishing);
  - c. Agricultural;
  - d. Industrial; and
  - e. Environmental (e.g., fish and wildlife propagation).
3. Human use or access to the facility and adjacent lands, including but not limited to:
  - a. Recreation;
  - b. Hunting;
  - c. Residential;
  - d. Commercial; and
  - e. Relationship between population locations and prevailing wind direction.
4. A description of the biota including benthic macro invertebrate and fish communities, in surface water bodies on, adjacent to, or affected by the facility. The aquatic biota expected in these water bodies in the absence of site-related contamination, based on physical habitat characteristics, should also be described.
5. Ecological characteristics of the facility. Data required for this may include the following: (a) Chemical sampling in potentially exposed habitats and reference sites, (b) Toxicity Testing, (c) Tissue analysis, (d) Biological Community assessment, (e) Habitat assessment of aquatic and terrestrial habitats on or potentially affected by this site, (f) Revised assessment of ecological impact on receptors. Impact should include those occurring at individual level

(e.g., mortality growth and reproductive impairments) and those occurring at higher levels of biological organization (i.e., at population, community, and ecosystem levels).

6. A demographic profile of the people who use or have access to the facility and adjacent land, including, but not limited to: age; sex; and sensitive subgroups.
7. A description of any endangered or threatened species near the facility.

TASK V: INVESTIGATION ANALYSIS

Defendant shall prepare an analysis and summary of all facility investigations and their results. The objective of this task shall be to ensure that the investigation data are sufficient in quality (e.g., quality assurance procedures have been followed) and quantity to describe the nature and extent of contamination, potential threat to human health and the environment, and to support the Corrective Measures Study.

A. Data Analysis

Defendant shall analyze all facility investigation data outlined in Task IV and prepare a report on the type and extent of contamination at the facility including sources and migration pathways. The report shall describe the extent of contamination (qualitative/quantitative) in relation to the background levels indicative for the area.

B. Protection Standards

1. Groundwater Protection Standards

Defendant shall provide information to support the Agency's selection/development of Groundwater Protection Standards for all of the 40 CFR Part 264 Appendix IX constituents found in the groundwater during the Facility Investigation (Task IV).

a. The Groundwater Protection Standards shall consist of:

- i) Maximum Contaminants Levels (MCLs) for constituents listed in the National Primary Drinking Water Regulations (40 CFR Part 141), if the background level of the constituent is below the given MCL; or
- ii) The background level of that constituent in the groundwater; or
- iii) A U.S. EPA-approved Alternate Concentration Limit (ACL).

b. Information to support the Agency's subsequent selection of Alternate Concentration Limits (ACL's) shall be developed by the Defendant in accordance with U.S. EPA guidance. For any proposed ACL's, Defendant shall include a justification based upon the criteria set forth in 40 CFR 264.94(b).

c. Within thirty (30) days of receipt of any proposed ACL's, the U.S. EPA shall notify Defendant in writing of approval, disapproval or modifications. The U.S. EPA shall specify in writing the reasons for any disapproval or modification.

d. Within thirty (30) days of receipt of the U.S. EPA's notification of disapproval of any proposed ACL, the Defendant shall amend and submit revisions to the U.S. EPA.

2. Other Relevant Protection Standards

Defendant shall identify and consider all relevant and applicable standards or criteria for protection of human health and the environment (e.g., National Ambient Air Quality Standards, Federally-approved State water quality standards, water quality criteria, health advisories, proposed MCLs, risk-based standards, etc.).

TASK VI: REPORTS

A. Preliminary and Workplan

Defendant shall submit to the U.S. EPA reports on Tasks I and II when it submits the RCRA Facility Investigation Workplan (Task III).

B. Progress

Defendant shall at a minimum provide U.S. EPA with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the RFI completed;
2. Summaries of all findings;
3. Summaries of all changes made in the RFI during the reporting period;
4. Summaries of all contacts with representatives of local community public interest groups or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

C. Draft and Final

Upon U.S. EPA approval, Defendant shall prepare a RCRA Facility Investigation Report to present Tasks IV and V. The RCRA Facility Investigation Report shall be developed in draft form for U.S. EPA review. The RCRA Facility Investigation Report shall be developed in final format incorporating comments received on the Draft RCRA Facility Investigation Report.

Three copies of all reports, including the Task I report, Task II report, Task III workplan, and both the Draft and Final RCRA Facility Investigation Reports (Tasks IV and V) shall be provided by the Defendant to U.S. EPA.

Facility Submission Summary

A summary of the information reporting requirements contained in the RCRA Facility Investigation Scope of Work is presented below.

<u>Facility Submission</u>	<u>Due date</u>
Description of Current Situation (Task I)	Within 45 days of lodging of the Consent Decree
Pre-Investigation Evaluation of Corrective Measure Technologies (Task II)	Within 45 days of lodging of the Consent Decree
RFI Work Plan (Task III)	Within 45 days of lodging of the Consent Decree
Final RFI Report	Contingent on schedule imposed in Workplan
Progress Reports on Tasks I through V	Monthly

**INTERIM MEASURES  
APPENDICES**

**APPENDIX A.     INTERIM MEASURES WORKPLAN**

1. Interim Measures Objectives
2. Health and Safety Plan
3. Community Relations Plan

**APPENDIX B.     INTERIM MEASURES INVESTIGATION PROGRAM**

1. Data Collection Quality Assurance
2. Data Management Plan

**APPENDIX C.     INTERIM MEASURES DESIGN PROGRAM**

1. Design Plans and Specifications
2. Operations and Maintenance Plan
3. Project Schedule
4. Final Design Documents

**APPENDIX D.     INTERIM MEASURES CONSTRUCTION QUALITY ASSURANCE PLAN**

1. Construction Quality Assurance Objectives
2. Inspection Activities
3. Sampling Requirements
4. Documentation

**APPENDIX E.     REPORTS**

1. Progress
2. Interim Measures Workplan
3. Final Design Documents
4. Draft Interim Measures Report
5. Final Interim Measures Report

APPENDIX AINTERIM MEASURES WORKPLAN

The Defendant shall prepare an Interim Measures Workplan. The Workplan shall include the development of several plans which shall be prepared concurrently.

A. Interim Measures Objectives

The Workplan shall specify the objectives of the interim measures, demonstrate how the interim measures will abate releases and threatened releases, and to the extent possible, be consistent and integrated with any long-term solution at the facility. The Interim Measures Workplan will include a discussion of the technical approach, engineering design, engineering plans, schedules, budget, and personnel. The Workplan will also include a description of qualifications of personnel performing or directing the interim measures, including contractor personnel. This plan shall also document the overall management approach to the interim measures.

B. Health and Safety Plan

Defendant shall prepare a facility Health and Safety Plan.

1. Major elements of the Health and Safety Plan shall include:

- a. Facility description, including availability of resources such as roads, water supplies, electricity and telephone services;
- b. Describe the known hazards and evaluate the risks associated with the incident and with each activity conducted;
- c. List key personnel and alternates responsible for site safety, response operations, and for protection of human health;
- d. Describe levels of protection to be worn by personnel;
- e. Delineate work area;
- f. Establish procedures to control site access;
- g. Describe decontamination procedures for personnel and equipment;
- h. Establish site emergency procedures;
- i. Address emergency medical care for injuries and toxicological problems;
- j. Describe requirements for an environmental surveillance program;
- k. Specify any routine and special training required for responders;
- l. Establish procedures for protecting workers from weather-related problems; and
- m. Establish emergency procedures.

2. The Facility Health and Safety Plan shall be consistent with:

- a. NIOSH Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities (1985);

- b. U.S. EPA Order 1440.1 - Respiratory Protection;
  - c. U.S. EPA Order 1440.3 - Health and Safety Requirements for Employees engaged in Field Activities;
  - d. Facility Contingency Plan;
  - e. U.S. EPA Standard Operating Safety Guide (1984);
  - f. OSHA regulations particularly in 29 CFR 1910 and 1926;
  - g. State and local regulations; and
  - h. Other U.S. EPA guidance as provided.
3. The Health and Safety Plan shall be revised to address the activities to be performed at the facility to implement the interim measures.

C. Community Relations Plan

Defendant shall prepare a plan for the dissemination of information to the public regarding interim measure activities and results. These activities shall include the preparation and distribution of fact sheets and participation in public meetings.

APPENDIX BINTERIM MEASURES INVESTIGATION PROGRAMA. Data Collection Quality Assurance Plan

Defendant shall prepare a plan to document all monitoring procedures, sampling, field measurements and sample analysis performed during the investigation to characterize the environmental setting, source, and contamination, so as to ensure that all information, data, and resulting decisions are technically sound, statistically valid, and properly documented.

1. Data Collection Strategy

The strategy section of the Data Collection Quality Assurance Plan shall include but not be limited to the following:

- a. A description of the intended uses for the data, and the necessary level of precision and accuracy for these intended uses;
- b. A description of methods and procedures to be used to assess the precision, accuracy, and completeness of the measurement data;
- c. A description of the rationale used to assure that the data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition or an environmental condition. Examples of factors which shall be considered and discussed include:

2. Sampling

The Sampling section of the Data Collection Quality Assurance Plan shall discuss:

- a. Selecting appropriate sampling locations, depths, etc.;
- b. Providing a statistically sufficient number of sampling sites;
- c. Measuring all necessary ancillary data;
- d. Determining which media are to be sampled (e.g., groundwater, air, soil, sediment, etc.);
- e. Determining which parameters are to be measured and where;
- f. Selecting the frequency of sampling and length of sampling period;
- g. Selecting the types of samples (e.g., composites vs. grabs) and number of samples to be collected;
- h. Documenting field sampling operations and procedures, including;
  - i) Documentation of procedures for preparation of reagents or supplies which become an integral part of the sample (e.g., filters, and adsorbing reagents);
  - ii) Procedures and forms for recording the exact location and specific considerations associated with sample acquisition;
  - iii) Documentation of specific sample preservation methods;

- iv) Calibration of field devices;
  - v) Collection of replicate samples;
  - vi) Submission of field-biased blanks, where appropriate;
  - vii) Potential interferences present at the facility;
  - viii) Construction materials and techniques, associated with monitoring wells and piezometers;
  - ix) Field equipment and sample containers listing;
  - x) Sampling order; and
  - xi) Decontamination procedures.
- i. Selecting appropriate sample containers;
  - j. Sample preservation; and
  - k. Chain-of-custody, including:
    - i) Standardized field tracking reporting forms to establish sample custody in the field prior to shipment; and
    - ii) Pre-prepared sample labels containing all information necessary for effective sample tracking.

### 3. Sample Analysis

The Sample Analysis section of the Data Collection Quality Assurance Plan shall specify the following:

- a. Chain-of-custody procedures, including:
  - i) Identification of a responsible party to act as sample custodian at the laboratory, who is authorized to sign for incoming field samples, obtain documents of shipment, and verify the data entered onto the sample custody records;
  - ii) Provisions for a laboratory samples custody log consisting of serially numbered standard lab-tracking report sheets; and
  - iii) Specification of laboratory sample custody procedures for sample handling, storage, and dispersment for analysis.
- b. Sample storage;
- c. Sample preparation methods;
- d. Analytical procedures, including:
  - i) Scope and application of the procedure;
  - ii) Sample matrix;
  - iii) Potential interferences;
  - iv) Precision and accuracy of the methodology; and

- v) Method detection limits.
- e. Calibration procedures and frequency;
- f. Data reduction, validation and reporting;
- g. Internal quality control checks, laboratory performance and system audits and frequency, including:
  - i) Method blank(s);
  - ii) Laboratory control sample(s);
  - iii) Calibration check sample(s);
  - iv) Replicate sample(s);
  - v) Matrix-spiked sample(s);
  - vi) "Blind" quality control sample(s);
  - vii) Control charts;
  - viii) Surrogate samples;
  - ix) Zero and span gases; and;
  - x) Reagent quality control checks.

A performance audit may be conducted by U.S. EPA on the laboratories selected by the Defendant.

- h. Preventative maintenance procedures and schedules;
- i. Corrective action (for laboratory problems); and
- j. Turnaround time.

#### B. Data Management Plan

Defendant shall develop and initiate a Data Management Plan to document and track investigation data and result. This plan shall identify and set up data documentation materials and procedures, project file requirements, and project-related progress reporting procedures and documents. The plan shall also provide the format to be used to present the raw data and conclusions of the investigation.

All groundwater data shall be submitted in a computer accessible format, i.e., diskette. The format used shall be compatible with the U.S. EPA, Region V groundwater database known as the Ground Water Information Tracking System (GRITS), Version 4.0.

##### 1. Data Record

The Data record shall include the following:

- a. Unique sample or field measurement codes;
- b. Sampling or field measurement location and sample or measurement types;

- c. Sampling or field measurement raw data;
- d. Laboratory analysis ID numbers;
- e. Properties or components measured; and
- f. Result of analysis (e.g., concentration).

## 2. Tabular Displays

The following data shall be presented in tabular displays:

- a. Unsorted (raw) data;
- b. Results for each medium, or for each constituent monitored;
- c. Data reduction for numerical analysis;
- d. Sorting of data by potential stratification factors (e.g., location, soil layer, topography); and
- e. Summary data.

## 3. Graphical Displays

The following data shall be presented in graphical formats (e.g., bar graphs, line graphs, area or plan maps, isopleths plots, cross-sectional plots or transects, three dimensional graphs, etc.):

- a. Display sampling location and sampling grid;
- b. Indicate boundaries of sampling area, and areas where more data are required;
- c. Display levels of contamination at each sampling location;
- d. Display geographical extent of contamination;
- e. Display contamination, levels, averages, and maxima;
- f. Illustrate changes in concentration in relation to distance from the source, time, depth or other parameters; and
- g. Indicate features affecting intramedia transport showing potential receptors.

APPENDIX CINTERIM MEASURES DESIGN PROGRAMA. Design Plans and Specifications

The Defendant shall develop clear and comprehensive design plans and specifications which include but are not limited to the following:

1. Discussion of the design strategy and the design basis, including:
  - a. Compliance with all applicable or relevant environmental and public health standards; and
  - b. Minimization of environmental and public impacts.
2. Discussion of the technical factors of importance including:
  - a. Use of currently accepted environmental control measures and technology;
  - b. The constructibility of the design; and
  - c. Use of currently acceptable construction practices and techniques.
3. Description of assumptions made and detailed justification of these assumptions;
4. Discussion of the possible sources of error and references to possible operation and maintenance problems;
5. Detailed drawings of the proposed design including:
  - a. Qualitative flow sheets;
  - b. Quantitative flow sheets;
  - c. Facility layout; and
  - d. Utility locations.
6. Tables listing materials, equipment and specifications;
7. Tables giving material balances;
8. Appendices including:
  - a. Sample calculations (one example presented and explained clearly for significant or unique design calculations);
  - b. Derivation of equations essential to understanding the report; and
  - c. Results of laboratory or field tests.

General correlations between drawings and technical specifications, is a basic requirement of any set of working construction plans and specifications. Before submitting the project specifications, the Defendant shall coordinate and cross-check the specifications and drawings and complete the proofing of the edited specifications and required cross-checking of all drawings and specifications.

B. Operation and Maintenance Plan

The Defendant shall prepare and Operation and Maintenance Plan to cover both implementation and long-term maintenance of the interim measure. The plan shall be composed of the following elements:

1. Equipment start-up and operator training

The Defendant shall prepare, and include in the technical specifications governing treatment systems, contractor requirements for providing: appropriate service visits by experienced personnel to supervise the installation, adjustment, startup and operation of the treatment systems; and training covering appropriate operational procedures once the startup has been successfully accomplished.

2. Description of normal operation and maintenance (O&M)

- a. Description of tasks for operation;
- b. Description of tasks for maintenance;
- c. Description of prescribed treatment or operation conditions;
- d. Schedule showing frequency of each O&M task; and
- e. Common and/or anticipated remedies.

3. Description of routine monitoring and laboratory testing

- a. Description of monitoring tasks;
- b. Description of required laboratory tests and their interpretation;
- c. Required QA/QC; and
- d. Schedule of monitoring frequency and date, if appropriate, when monitoring may cease.

4. Description of equipment

- a. Equipment identification;
- b. Installation of monitoring components;
- c. Maintenance of site equipment; and
- d. Replacement schedule for equipment and installed components.

5. Records and reporting mechanisms required

- a. Daily operating logs;
- b. Laboratory records;
- c. Mechanism for reporting emergencies;
- d. Personnel and maintenance records; and
- e. Monthly/annual reports to Federal/State agencies.

The Operation and Maintenance Plan shall be submitted with the Final Design Documents.

C. Project Schedule

The Defendant shall develop a detailed Project Schedule for construction and implementation of the interim measure(s) which identifies timing for initiation and completion of all critical path tasks. Defendant shall specifically identify dates for completion of the project and major interim milestones which are enforceable terms of this order. A Project Schedule shall be submitted simultaneously with the Final Design Documents.

D. Final Design Documents

The Final Design Documents shall consist of the Final Design Plans and Specification (100%) complete, the final Draft Operation and Maintenance Plan, and Project Schedule. The Defendant shall submit the final documents 100% complete with reproducible drawings and specifications. The quality of the design documents should be such that the Defendant would be able to include them in a bid package and invite contractors to submit bids for the construction project.

APPENDIX DINTERIM MEASURE CONSTRUCTION QUALITY ASSURANCE PLANA. Construction Quality Assurance Objectives

In the CQA plan, the Defendant shall identify and document the objectives and framework for the development of a construction quality assurance program including, but not limited to the following: responsibility and authority; personnel qualifications; inspection activities, sampling requirements; and documentation. The responsibility and authority of all organizations (i.e., technical consultants, construction firms, etc.) and key personnel involved in the construction of the interim measure should be described fully in the CQA plan. The Defendant must identify a CQA officer and the necessary supporting inspection staff.

B. Inspection Activities

The observations and tests that will be used to monitor the construction and/or installation of the components of the interim measure(s) shall be summarized in the CQA plan. The plan shall include the scope and frequency of each type of inspection. Inspections shall verify compliance with all environmental requirements and include, but not be limited to air quality and emissions monitoring records, waste disposal records (e.g., RCRA transportation manifests), etc. The inspection should also ensure compliance with all health and safety procedures. In addition to oversight inspections, the Defendant shall conduct the following activities:

1. Preconstruction inspection and meeting

The Defendant shall conduct a preconstruction inspection and meeting to:

- a. Review methods for documenting and reporting inspection data;
- b. Review methods for distributing and storing documents and reports;
- c. Review work area security and protocol;
- d. Discuss any appropriate modifications of the construction quality assurance plan to ensure that site-specific considerations are addressed; and
- e. Conduct a site walk-around to verify that the design criteria, plans, and specifications are understood and to review material and equipment storage locations.

The preconstruction inspection and meeting shall be documented by a designated person and minutes should be transmitted to all parties.

2. Prefinal inspection

Upon preliminary project completion, Defendant shall notify U.S. EPA for the purposes of conducting a prefinal inspection. The prefinal inspection will consist of a walk-through inspection of the entire project site. The inspection is to determine whether the project is complete and consistent with the contract documents and the U.S. EPA approved interim measure. Any outstanding construction items discovered during the inspection will be identified and noted. Additionally, treatment equipment will be operationally tested by the

Defendant to certify that the equipment has performed to meet the purpose and intent of the specifications. Retesting will be completed where deficiencies are revealed. The prefinal inspection report should outline the outstanding construction items, actions required to resolve items, completion date for these items, and date for final inspection.

### 3. Final Inspection

Upon completion of any outstanding construction items, the Defendant shall notify U.S. EPA for the purpose of conducting a final inspection. The final inspection will consist of a walk-through inspection of the project site. The prefinal inspection will be used as a checklist and focusing on the outstanding items that have not been resolved.

### 4. Sampling and Testing Requirements

The sampling and testing activities, sample size, sample and test locations, frequency of testing, acceptance and rejection criteria, and plans for correcting problems should be presented in the CQA.

## C. Documentation

Reporting requirements for CQA activities shall be described in detail the CQA plan. This shall include such items as daily summary reports, inspection data sheets, problem identification and interim measures reports, design acceptance reports and final documentation. Provisions for the final storage of all records shall be presented in the CQA plan.

APPENDIX EREPORTSA. Progress

The Defendant shall at a minimum provide the U.S. EPA with signed, monthly progress reports containing:

1. A description and estimate of the percentage of the interim measures completed;
2. Summaries of all findings;
3. Summaries of all changes made in the interim measures during the reporting period;
4. Summaries of all contacts with representatives of the local community, public interest groups, or State government during the reporting period;
5. Summaries of all problems or potential problems encountered during the reporting period;
6. Actions being taken to rectify problems;
7. Changes in personnel during the reporting period;
8. Projected work for the next reporting period; and
9. Copies of daily reports, inspection reports, laboratory/monitoring data, etc.

B. Interim Measures Workplan

The Defendant shall submit an Interim Measures Workplan as described in Appendix A, B, C, and D.

C. Final Design Documents

The Defendant shall submit the Final Design Documents as described in Appendix C.

D. Draft Interim Measures Report

At the "completion" of the construction of the project (except for long-term operations, maintenance and monitoring), the Defendant shall submit an Interim Measures and Implementation Report to the Agency. The Report shall document that the project is consistent with the design specifications, and that the interim measures are performing adequately. The Report shall include, but not be limited to the following elements:

1. Synopsis of the interim measures and certification of the design and construction;
2. Explanation of any modifications to the plan and why these were necessary for the project;
3. Listing of criteria, established before the interim measures were initiated, for judging the functioning of the interim measures and also explaining any modification to these criteria;

4. Results of facility monitoring, indicating that interim measures will meet or exceed the performance criteria; and
5. Explanation of the operation and maintenance (including monitoring) to be undertaken at the facility.

This report shall include of the inspection summary reports, inspection data sheets, problem identification and corrective measure reports, block evaluation reports, photographic reporting data sheets, design engineers' acceptance reports, deviations from design and material specifications (with justifying documentation) and as-built drawings.

E. Final Interim Measures Report

The Defendant shall finalize the Interim Measures Work Plan and the Interim Measures Implementation Report incorporating comments received on draft submissions.

Facility Submission Summary

A summary of the information reporting requirements contained in the Interim measures Scope of Work is present below:

FACILITY SUBMISSIONS	DUE DATE
INTERIM MEASURES WORKPLAN -Interim Measures Objectives -Health and Safety Plan -Community Relations Plan -Data Collection QA Plan -Data Management Plan -Construction QA Plan	60 days
Final Design Documents -Design Plans and Specs -O&M Plan -Project Schedule	60 days
Draft Interim Measures Report	Upon completion of construction
Final Interim Measures Report	15 days after receipt of U.S. EPA comments on Draft Interim Measures Report
Progress Reports	Monthly

\*All dates are calculated from the effective date of this order unless otherwise specified.